

S.N. 09/838,741

1.(Amended) In an electric motor having a shaft [,] and a bearing located within a housing that is adapted to be filled with lubricant, [and passages communicating the shaft and the bearing,] the improvement comprising:

at least one centrifugal lubricant pump stage located in the housing, the pump stage having an impeller attached to and rotating with the shaft and a mating diffuser for pressurizing the lubricant; and

a flow passage leading from the lubricant pump stage to the bearing.

2. (Amended) The [apparatus] motor of claim 1, wherein:

the at least one pump stage further comprises a second pump stage having an impeller and a diffuser mounted in the housing downstream of the first pump stage for further pressurizing the lubricant.

3. (Amended) The [apparatus] motor of claim 1, wherein:

the diffuser is upstream of the impeller.

4. (Amended) The [apparatus] motor of claim 1, wherein:

the pump stage is oriented for discharging lubricant in an opposite direction from the bearings.

5. (Amended) The [apparatus] motor of claim 1, wherein:

the impeller of the pump stage has substantially radial flow passages.

6. (Amended) The [apparatus] motor of claim 1, wherein:

a chamber is located in a lower portion of the housing for containing a volume of lubricant;

the shaft is hollow, and [has a] the flow passage is within the shaft for communicating fluid from the chamber to the bearings; and

the pump stage discharges downward.

7. (Amended) An electric submersible pump assembly for a well, the assembly comprising:

an electrical motor having a shaft [,] and a bearing located within a housing that is adapted to be filled with lubricant [, and passages communicating the shaft and the bearing];

a chamber located in a lower portion of the housing for containing a volume of lubricant;

a flow passage within the shaft leading from the chamber to the bearing;

first and second centrifugal lubricant pump stages, each pump stage located in the chamber of the housing and each having an impeller attached to and rotating with the shaft and a mating diffuser for pressurizing the lubricant; [wherein]

[the diffuser in the first pump stage leads to the impeller in the first stage, the impeller of the first stage leads to the diffuser of the second stage, the diffuser of the second stage leads to the impeller of the second stage, and the impeller of the second stage leads to the chamber;] and

a pump exterior of the motor and connected to the shaft for pumping well fluid.

New Claims:

12. A method of operating an electric motor having a shaft and a bearing located within a housing that is adapted to be filled with lubricant, comprising:

mounting at least one centrifugal lubricant pump stage in the housing, the pump stage having an impeller attached to and rotating with the shaft and a mating diffuser for pressurizing the lubricant;

supplying power to the motor to cause the shaft and the impeller to rotate; and

with the pump stage, applying pressure to the lubricant and flowing the lubricant to the bearing.

13. The method of claim 12 wherein the pressure of the lubricant is at least about 30 pounds per square inch.